no. 60/198,319. Applicants respectfully request that the Examiner acknowledge Applicants' claim in the next written communication from the United States Patent and Trademark Office.

In the Office Action, claims 1-9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 4,597,451 to Moore et al. in view of U.S. Patent 3,908,814 to Eguchi; claims 10-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Moore et al. in view of Eguchi and in further view of U.S. Patent 4,987,958 to Fierbaugh; claims 14-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Moore et al. in view of Eguchi and in further view of U.S. Patent 6,032,745 to Sears; and claims 18-27 and 41-42 were rejected under under 35 U.S.C. § 103(a) as being unpatentable over Moore et al. in view of U.S. Patent 5,899,414 to Duffo. Applicants respectfully traverse these rejections for the following reasons.

Claim 1 is directed to a system for detecting and suppressing a fire condition in a storage unit for storing freight in a storage area. The system includes, among other things, a transmitter "associated with a storage unit" and a fire suppression device "configured to discharge a fire suppressant material into the storage unit." None of the references cited by the Examiner discloses or teaches the systems for detecting and suppressing a fire condition in a storage unit, as defined by the Applicants.

Specifically, the specification states at page 9. lines 9-11, "the fire suppression and indicator system 100 is applied to detect and suppress fires in freight containers or *storage units* . . . ." (Emphasis added.) The specification also defines storage units as "pallets loaded with freight and covered with restrained fire retardant blankets" at page

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9, lines 21-22. Finally, at page 10, lines 1-2, the specification states " a plurality of freight containers 300 may be placed in the cargo or storage area 210 of the aircraft 200," thereby distinguishing between freight containers (or storage units) and the storage area for the containers. All of the storage units store freight and provide individual units where fires are detected and controlled. These storage units are not limited to use in cargo areas of aircraft, but may be used in other locations, such as, trucks, trailers, or remote locations connected by phone lines. See page 28, lines 13-17.

Moore et al. is directed to a fire detection and suppression system having a plurality of individual fire detection-suppression means placed at different positions within an area to be protected. See col. 1, lines 17-21. Eight such fire detection-suppression means may be physically positioned around an area, for example, an area in a ship. See col. 2, lines 9-13.

Applicants note that Moore et al. uses the term "storage unit" in association with the master station 22. See col. 5, line 63, to col. 6, line 12. However, the term refers to some type of memory device that stores signals from fire suppression devices. Moore et al. does not disclose or suggest placing freight in individual storage units as disclosed and claimed. Therefore, Applicants respectfully traverse the Examiner's impression that Moore et al. "disclose a system for detecting and suppressing a fire condition in a plurality storage units."

None of the other references, Euguchi, Fierbaugh, Sears, Duffoo, relied on by the Examiner teaches or suggests a system for detecting and suppressing a fire condition in a storage unit, and none teaches or suggests the claimed combination as a

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whole. In addition, Applicants respectfully submit that the selection and application of the references against the claimed combination of record would be based on impermissible hindsight. Therefore, the § 103(a) rejection should be withdrawn.

As for the rejections of claims 18-27 and 41-42, Applicants respectfully submit that these claims are patentable over the prior art of record for the reasons explained above. In addition, Applicants note that the Examiner has based his rejection of the claims on "Moore et al., as modified" without indicating what modification the Examiner is relying on and why any such modification is taught or suggested by the prior art.

Newly added claims 43-57 are allowable for at least the same reasons described above. In addition, claims 43-57 are allowable because each system includes a transmitter that is configured to transmit a first signal upon detection of the fire condition, wherein the first signal is an infrared signal.

The Examiner alleges that Moore et al. at col. 2., line 24 discloses an infrared signal to indicate a fire condition detection. See page 4 of Office Action. Applicants respectfully traverse this interpretation of Moore et al. The relevant portion of Moore et al. states that a fire detection and suppression unit "comprises two radiation sensors 30 and 32" and that "[s]ensor 30 may be in the form of a thermopile and is associated with a filter 34 having a narrow radiation passband at 4.4 microns. Infra-red radiation at this frequency therefore falls on the sensor 30 which produces a corresponding electrical signal." (Emphasis Added). This electrical signal is not an infrared signal as claimed by Applicants.

Specifically, Applicants transmitter is configured to transmit an infrared signal upon detection of a fire condition. Moore et al. relies on infrared radiation to indicate a

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small or large fire, and then transmits an electrical signal upon detection of the small or large fire. Therefore, Moore et al. cannot anticipate newly added claims 43-57.

In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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Dated: February 3, 2003

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APPENDIX TO AMENDMENT

VERSION WITH MARKINGS TO SHOW CHANGES MADE

AMENDMENTS TO THE SPECIFICATION

Replace the paragraph on page 5, lines 11-13, with the following paragraph:

In another aspect, there are a plurality of storage units, a plurality of transmitters, and a plurality of receivers. An individual transmitter and an individual receiver may be associated with each of the plurality of storage units.[.]

Replace the paragraph on page 6, lines 4-14, with the following paragraph:

The present invention is also directed at a fire suppression and indication system for use in an aircraft. The present invention proposes two methods to deal with aircraft cargo fires. The first is a container based extinguishing system. The second is an aircraft based system. The aircraft includes a cockpit, a control panel in the cockpit, and a storage area. The system includes a plurality of storage units located at predetermined positions in the storage area[.], a transmitter associated with each storage unit and configured to transmit a first signal upon detection of the fire condition, at least one receiver configured to detect the first signal and configured to provide a second signal indication detection of the fire condition, and a fire suppression device configured to discharge a fire suppressant material into the storage unit upon detection of the fire condition.

Replace the paragraph on page 11, lines 18-23, with the following paragraph:

Fig. 3 shows schematically one possible arrangement of the transmitter 104. The transmitter 104 comprises a transmitter casing 108 (not shown in this view), a printed circuit 110, an IR diode 112, a first switch 114, and a power source 116. The IR

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diode 112 is illuminated when the first switch 114 is closed. The first switch 114 may be closed when the fire detection and suppression device 102 is activated. This process will be explained below. The power source 116 can be a battery, such as a lithium cell.

Replace the paragraph on page 12, lines 1-16, with the following paragraph:

Optionally, the transmitter 104 can also include any of the following components: an oscillator/driver 118, a red light emitting diode (LED) 120, a test button 122, or a second switch 124. The second switch is shown in a series [arrange] arrangement, but it could also be arranged in parallel to the first switch, if desired. The oscillator/driver 118 will allow the IR diode 112 to pulse at a predetermined frequency, such as 40 kHz, or multiplexed. If a continuous signal is desired, the oscillator/driver 118 can be eliminated. The LED 120 and test button 122 will allow personnel to verify that the circuit 110 is functioning properly. The second switch 124 will allow the transmitter 104, when configured to operate on two separate frequencies, to measure a different occurrence than the first switch 114. For example, the second switch 124 can be a bimetallic switch that operates independent from the first switch 114. In this arrangement, the first switch 114 may activate a signal indicating the discharge of the fire detection and suppression device 102, and the second switch 124 may activate a second signal when the temperature inside the container reaches a predetermined temperature. This information will inform the personnel whether a fire or fire condition was detected, and whether the fire or fire condition has been suppressed.

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Replace the following paragraphs staring on page 13, line 11 and ending on page 14, line 14, with the following paragraphs:

In certain preferred embodiments, the fire detection and suppression device 102 for a given container (or area) may be a unitary device of relatively simple and inexpensive design. Exemplary embodiments of such devices are illustrated in Figs. 4-10. Generally, the fire detection and suppression device 102 includes a fire bottle 130, a discharge tube 132, and a fire detection component or [system133] system 133 arranged in said discharge tube 132. The fire bottle 130 is a relatively simple pressurized vessel 134 having a mouth or opening 135, and the fire suppression material or extinguishing agent 136 in the bottle 130 is applied to the container 300 through a discharge port [138in] 138 in the discharge tube 132. The fire detection component includes a thermal plug 148, a rod 152, and a seal 154, all of which will be described below. In some embodiments the transmitter 106 is fixed to the discharge tube 132.

In one preferred embodiment, as seen in Fig. 4-6, the discharge tube 132 is a hollow cylinder 140 with an open end 142 proximal to the fire bottle 130 and a partially closed end at the distal end 144 of the cylinder 140. The open end 142 is pressed, glued, or otherwise attached to an aluminum fitting 143, which is screwed into the mouth or opening 135 of the pressurized vessel 134. An o-ring 137 assists in completing a seal between the aluminum fitting 143[,] and the mouth 135. The discharge port 138 is located in the hollow cylinder 140 at a predetermined distance from the fire bottle 130.

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A hollow cylindrical guide 146, which may be six inches long depending on the size of the hollow cylinder 140, is disposed at the distal end 144 of the cylinder 140. The hollow guide 146 and hollow [cylinder140] cylinder 140 are preferably made from a material that does not rapidly conduct thermal energy.

A thermal fuse plug 148 may be located between the distal end 142 of the hollow cylinder 140 and the guide 146. Alternatively, the fuse plug 148 may be inside the guide 146. In this preferred embodiment, the fuse plug 148 is designed to melt at a predetermined temperature.

Replace the paragraph on page 21, lines 5-14, with the following paragraph:

As seen in Fig. 12, the transmitter 104 may be installed in the cover 310 of a container 300 or sewn into a fire resistant blanket 410 to be used to cover palletized freight. This blanket 410 may also serve as [an] a fire suppressant material retention device. When installed on a container 300 the transmitter can be narrowly focused and adjusted so that the receiver 106 located overhead in the aircraft will only "see" the container 300 directly below it. When installed on a pallet 400, the signal from the transmitter may be adjusted so that it may trigger any receiver 106 in its field of view. The transmitter 104 installed on containers can use a different channel or made of transmissions than those installed on pallets. In a preferred embodiment, the receiver 106 may be installed directly over each storage unit position in the cargo area 210.

Replace the paragraph starting on page 24, line 21, and ending on page 25, line 7, with the following paragraph:

The actuator plunger 622 may be activated by a burst of pressurized gas from the pressurized agent storage container 603. This burst may be triggered when the

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alerting transmitter 104 signals its receiver 106 which, in turn, signals the control unit 500. Once triggered the agent storage container 603 and distribution system (manifold in the aircraft) supplies pressurized gas to activate the actuator plunger 622. A drawback to this system is that two lines from the agent pressure storage container 603 would be required, one to supply gas to activate the plunger 622 and another to provide extinguishing agent to the popup device 600 and thence to the storage container 300. Alternatively, [a] an electrical solenoid or electrically fired gas generating device (squib) could be used to activate the plunger.

Replace the following paragraphs starting on page 25, line 17, and ending on page 26, line 12, with the following paragraphs"

In operation, a significant temperature increase, such as from a fire in a container 300 or under the blanket 410 on a pallet 400, will close the bimetallic switch 114 in the transmitter. This will send a signal to the receiver 106 located overhead in the aircraft. When excited by a signal from a transmitter 104, the receiver 106 will transmit an electrical signal to the control unit 500, which consists of an amplifier and multi-channel relay. The control unit 500 determines which channel has been triggered. If it received a signal from a Channel 1 source (i.e., a pallet) it sends a signal to a control panel 230 in the cockpit where it announces that a thermal event has taken place in a pallet 400. If the control unit receives a signal from a Channel 2 source (i.e., a container), it sends a pulse to the activation device 601 associated with the popup device 600, located underneath the involved container 300. This signal causes the popup device 600 to extend and press against the base 330 of the container 300. This seals the popup device 600 to the bottom of the container base 330, in which hole 332 has been

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provided to allow fire suppressant material to disperse into the container 300. Then, the desired preselected charge [offire] of fire suppressant material is released into the container.

The crew can monitor the status of the fire or fire condition and respond accordingly. For example, if the [the] fire continues, one of the crew can replace and [active] activate another agent storage container 603 to supply additional fire suppressant material to the container.

AMENDMENTS TO THE CLAIMS

1. (Amended) A system for detecting and suppressing a fire condition in a storage unit for storing freight in a storage area, the system comprising:

a transmitter associated with the storage unit and configured to transmit a first signal upon detection of the fire condition;

at least one receiver configured to detect the first signal and configured to provide a second signal indicating detection of the fire condition; and

a fire suppression device configured to discharge a fire suppressant material into the storage unit upon detection of the fire condition.

3. (Amended) A system according to claim [1] 2, wherein each of the storage units is located at a predetermined position relative to the individual receiver associated with the storage unit.

6. (Amended) A system according to claim 2, wherein at least some of the storage units are pallets including blankets for storing the freight.

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18. (Amended) A fire suppression and indication system for use in an aircraft, the aircraft having a cockpit, a control panel in the cockpit, and a storage area, the system comprising:

a plurality of storage units for storing freight, the storage units being located at predetermined positions in the storage area;

a transmitter associated with each storage unit and configured to transmit a first signal upon detection of the fire condition;

at least one receiver configured to detect the first signal and configured to provide a second signal [indication] indicating detection of the fire condition; and

a fire suppression device configured to discharge a fire suppressant material into the storage unit upon detection of the fire condition.

19. (Amended) A system according to claim 18, wherein the fire suppression device includes a source of pressurized fire suppressant material and an application mechanism associated with one of the predetermined positions, the application mechanism [is] being arranged between one of the storage units and the source and configured to apply the fire suppression device to the storage unit upon detection of the fire condition.

23. (Amended) A system according to claim 18, wherein at least one of the storage [unit] units is a pallet including a fire resistant blanket, and the fire suppression device is arranged below the fire resistant blanket.

26. (Amended) A system according to claim 25, wherein the control unit transmits a fourth signal to the fire suppression device to discharge the fire suppressant material into the [container] storage unit.

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